

**Carestream**



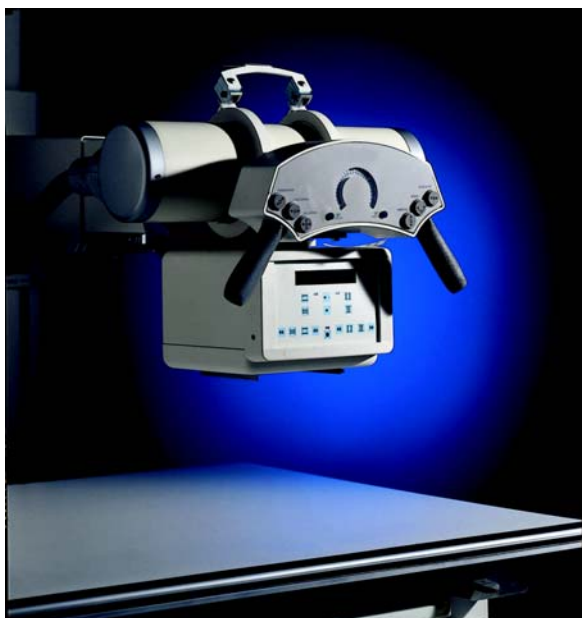
Model QS-500

# Floor-to-Ceiling/Wall Tubestand

Model QS-550

# Free-Standing Tubestand

## OPERATOR MANUAL



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## Revision History

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## Revision History

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# Chapter

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# 1

## *SAFETY NOTICES*







## GENERAL SAFETY INFORMATION

Quantum products are designed to meet stringent safety standards. All medical electrical equipment requires proper installation, operation, and maintenance (particularly with regard to safety).

It is vital that the user read, understand, note, and where applicable, strictly observe all Warnings, Cautions, Notes and Safety markings within this document and on the equipment, and that the user strictly follow all safety directions in this manual to help ensure the safety of users and patients.

Every reasonable precaution has been taken during manufacture to safeguard the health and safety of persons who will operate this equipment. The following precautions must be observed at all times.

## WARNINGS, CAUTIONS, NOTES

The following samples show how warnings, cautions, and notes appear in this document. The text explains their intended use.



**WARNING**

Indicates injury or death is possible if the instructions are not obeyed.



**CAUTION**

Indicates that damage to equipment is possible if the instructions are not obeyed.



**NOTE**

Indicates essential information that should be read to avoid incorrect operation.

The purpose of safety icons, such as those shown below, is to indicate at a glance the type of caution, warning or danger.



**WARNING**

Ionizing radiation: indicates the possibility of increased levels of radiation.



**WARNING**

Indicates that damage to equipment is possible if the instructions are not obeyed.



**WARNING**

Indicates essential information that should be read to avoid incorrect operation.

# Chapter 1 Safety Notices



## **WARNING**

Quantum Medical Imaging, LLC disclaims all responsibility from any injury resulting from improper application of this equipment.

This equipment is sold to be used exclusively under the prescribed direction of a person who is licensed by law to operate equipment of this nature. This equipment must be used in accordance with all safety procedures described in this manual and must not be used for purposes other than those described herein. In the United States, Federal law restricts this device to sale, distribution, and use by or on order of a licensed physician.

Quantum Medical Imaging, LLC cannot assume responsibility for any malfunctioning of this equipment resulting from improper operation, maintenance, or repair, or from damage or modification of its components.

Failure to observe these warnings may cause serious injuries.



## **X-RAY PROTECTION**

X-rays are hazardous to both patient and operator unless established safe exposure factors and operating instructions are observed.

Only qualified and authorized personnel shall operate this system. In this context, qualified means those legally permitted to operate this equipment in the jurisdiction in which the equipment is being used, and authorized means those authorized by the authority controlling the use of the equipment. Full use must be made of all radiation protection features, devices, systems, procedures and accessories.

It is important that everyone having anything to do with x-radiation be properly trained and fully acquainted with the recommendations of the National Council on Radiation Protection and Measurements as published in NCRP Reports available from NCRP Publications, 7910 Woodmont Avenue, Suite 800, Bethesda, Maryland 20814-3095 ([www.ncrp.com](http://www.ncrp.com)), and of the International Commission on Radiological Protection ([www.icrp.org](http://www.icrp.org)), and take adequate steps to protect against injury.



## **WARNING**

X-ray equipment may cause injury if used improperly. The instructions contained in this manual must be read and followed when operating this unit. Personal radiation monitoring and protective devices are available. You are urged to use them to protect against unnecessary X-ray exposure.



**NOTE:** This device is designed to support the loads imposed by the specific X-ray Tube and Collimator combinations referenced in Service Manuals DC30-005 and DC30-009. The application of components not shown therein is not authorized.

## REGULATORY COMPLIANCE

The Floor-to-Ceiling Tubestand, Model QS-500 or Free-Standing Tubestand, Model TQS-550 (hereinafter referred to as the Tubestand) is not a CDRH certifiable product. However, the Tubestand must be compatible and operate in conjunction with other components in the X-ray System so that the X-ray System performs in compliance with H.E.W. Performance Standards. This product has been factory tested to assure its required performance in an X-ray System.

Those responsible for the planning of x-ray equipment installations must be thoroughly familiar and comply completely with NCRP Report No. 49, "Structural Shielding Design and Evaluation for Medical Use of X-Rays and Gamma Rays of Energies up to 10 MeV", as revised or replaced in the future. Those authorized to operate, test, participate in or supervise the operation of the equipment must be thoroughly familiar and comply completely with the currently established safe exposure factors and procedures described in publications such as Subchapter J of Title 21 of the Code of Federal Regulations, "Diagnostic X-Ray Systems and Their Major Components," and NCRP Report No. 102, "Medical X-Ray, Electron Beam and Gamma Ray Protection for Energies Up to 50 MeV—Equipment Design and Use" as revised or replaced in the future.

This equipment must only be used in rooms that comply with all applicable laws or regulations that have the force of law, concerning electrical safety for this type of equipment.

Scheduled maintenance is essential to the assurance of continued integrity of this equipment with respect to regulatory compliance. The continuance of certified performance to the regulatory standard is incumbent upon the user's diligent conformance to recommended maintenance instructions.

Complies with EC Directive 93/42/EEC for Medical Devices.



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## CLASSIFICATION

This product has been classified as Class I, Type B by Underwriters Laboratories, Inc. Equipment not suitable for use in the presence of a flammable anesthetic mixture of air with oxygen or with nitrous oxide. Protection against Harmful Ingress of Water (Ordinary), enclosed equipment without protection against ingress of liquids.

# Chapter 1 Safety Notices



MEDICAL ELECTRICAL EQUIPMENT  
WITH RESPECT TO ELECTRIC SHOCK, FIRE,  
MECHANICAL HAZARDS ONLY IN ACCORDANCE  
WITH UL 60601-1 AND CAN/CSA C22.2 NO. 601.1  
98UA

The following symbols may be used for marking on this equipment or equipment documentation:

	Earth (ground)		Type B Equipment
	Protective Earth (ground)		Enable Longitudinal Tube Motion
	Enable Tube Angulation Motion		Enable Vertical Tube Motion
	Enable Tube Motion in All Directions		Enable Transverse Tube Motion
	Enable Rotation of Vertical Column Motion		Non-ionizing radiation
	Enable Auto-Stop Function		

## COMPATIBILITY

The equipment described in this manual must only be used in combination with other equipment or components if these are expressly recognized by Quantum Medical Imaging, LLC as compatible.

## INTENDED OPERATOR

This equipment is intended to be installed, used and operated only in accordance with the safety procedures given within this manual for the purpose for which it was designed. Before attempting to work with this equipment, read, understand, note and strictly observe all warnings, cautions and safety markings on the equipment.

Users include those persons who actually handle the equipment and those who have authority over the equipment.

## TRAINING

Users of this equipment shall have received adequate training on its safe and effective use before attempting to work with the equipment. Training requirements may vary from country to country. The User shall make sure that training is received in accordance with local laws or regulations that have the force of law.

## **ACCOMPANYING DOCUMENTATION**

The documentation consists of a User manual (this document) and related documentation:

- Tube Stand Model QS-500 Service Manual P/N DC30-005 or Tube Stand Model QS-550 Service Manual P/N DC30-009: Contains technical and service documentation for this product, including installation and configuration instructions to be performed by qualified persons

The documentation shall be kept with the system for easy reference.

## **APPLICABLE STANDARDS**

This equipment complies with the following regulatory standards:

- EN 60601-1: 1990 + A1:1993 + A2:1995 + A13:1996
- IEC 60601-2-32: 1994
- CAN/CSA-C22.2 No. 601.1-M90, 2005 (Medical Electrical Equipment, part 1: General Requirements for Safety)
- UL 60601-1, 1st Edition, 2006-04-26 (Medical Electrical Equipment, part 1: General Requirements for Safety)
- IEC 60601-1 Medical electrical equipment, Part 1: General requirements for safety
- IEC 60601-1-2: 2007

## **ENVIRONMENTAL PROTECTION**

This equipment contains certain materials and chemical compounds incidental to the manufacture of electrical and electronic equipment, and improper "end-of-life" disposal of such equipment can result in environmental contamination. Therefore, this equipment should not be disposed of as ordinary household waste, but should instead be delivered to a designated electrical and electronic waste disposal or recycling center. For further information on disposing of electrical and electronic waste, contact the cognizant authority within the jurisdiction.

# Chapter 1 Safety Notices

## **ELECTROMAGNETIC COMPATIBILITY (EN 60601-1-2:2007/IEC 60601-1-2:2007)**

The tubestand is intended for use in the electromagnetic environment specified below. As such, it must be installed and put into service according to the information provided in the accompanying Service Manual.

Portable and mobile RF communications equipment can affect medical electrical equipment. It is therefore recommended that the operation of equipment of this type, such as mobile telephones, cordless microphones and other similar mobile radio equipment, be restricted from the vicinity of this device.


Use of accessories, transducers and cables, other than those specified in the accompanying documents, may result in increased emissions or decreased immunity of the equipment.

Guidance and manufacturer's declaration - electromagnetic emissions		
<i>The Tubestand is intended for use in the electromagnetic environment specified below. The customer or the user of the Tubestand should assure that it is used in such an environment.</i>		
Emissions test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR 11	Group 1	The Tubestand uses RF energy only for their internal functions. Therefore, the RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.  The Tubestand is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
RF emissions CISPR 11	Class A	
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

# Chapter 1 Safety Notices

Guidance and manufacturer's declaration - electromagnetic immunity			
<i>The Tubestand is intended for use in the electromagnetic environment specified below. The customer or the user of the Tubestand should assure that it is used in such an environment.</i>			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	±1 kV differential mode ±2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruption, and voltage variations on power supply input lines IEC 60601-4-11	< 5 % $U_T$ (>95 % dip in $U_T$ ) for 0.5 cycle  40 % $U_T$ (60 % dip in $U_T$ ) for 5 cycles  70 % $U_T$ (30 % dip in $U_T$ ) < 5 % $U_T$ (> 95 % dip in $U_T$ ) for 5 s	< 5 % $U_T$ (>95 % dip in $U_T$ ) for 0.5 cycle  40 % $U_T$ (60 % dip in $U_T$ ) for 5 cycles  70 % $U_T$ (30 % dip in $U_T$ ) < 5 % $U_T$ (> 95 % dip in $U_T$ ) for 5 s	Mains power quality should be that of a typical commercial or hospital environment. If the user of the Tubestand requires continued operation during power mains interruptions, it is recommended that the Tubestand be powered from an uninterruptible power supply or battery.
Power frequency (50/60 Hz) IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment
NOTE: $U_T$ is the A.C. mains voltage prior to application of the test level.			

# Chapter 1 Safety Notices

Guidance and manufacturer's declaration - electromagnetic immunity			
<i>The Tubestand is intended for use in the electromagnetic environment specified below. The customer or the user of the Tubestand should assure that it is used in such an environment.</i>			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Conducted RF IEC 61000-4-6  Radiated RF IEC 61000-4-3	3 Vrms 150 kHz to 80MHz  3 V/m 80 MHz to 2,5 GHz	3 Vrms  3 V/m	<p>Portable and mobile RF communications equipment should be used no closer to any part of the Tubestand, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> <p><b>Recommended separation distance</b></p> $d = 1,2\sqrt{P}$ $d = 1,2\sqrt{P} \quad , 80 \text{ MHz to } 800 \text{ MHz}$ $d = 2,3\sqrt{P} \quad , 800 \text{ MHz to } 2,5 \text{ GHz}$ <p>where <math>P</math> is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and <math>d</math> is the recommended separation distance in metres (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey<sup>a</sup>, should be less than the compliance level in each frequency range.<sup>b</sup> Interference may occur in the vicinity of equipment marked with the following symbol:</p> 



# Chapter 1 Safety Notices

## Guidance and manufacturer's declaration - electromagnetic immunity

NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

<sup>a</sup> Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the Tubestand is used exceeds the applicable RF compliance level above, the Tubestands (including TechVision option) should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the Tubestand.

<sup>b</sup> Over the frequency range 150 kHz to 80 kHz, field strengths should be less than 3 V/m.

## Recommended separation distances between portable and mobile RF communications equipment and the Tubestand (including TechVision option)

*The Tubestand is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the Tubestand can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Tubestand as recommended below, according to the maximum output power of the communications equipment.*

Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz $d = 1,2\sqrt{P}$	80 MHz to 800 MHz $d = 1,2\sqrt{P}$	800 MHz to 2,5 GHz $d = 2,3\sqrt{P}$
0,01	0,12	0,12	0,23
0,1	0,38	0,38	0,73
1	1,2	1,2	2,3
10	3,8	3,8	7,3
100	12	12	23

# Chapter 1 Safety Notices

## Recommended separation distances between portable and mobile RF communications equipment and the Tubestand (including TechVision option)

For transmitters rated at a maximum output power not listed above, the recommended separation distance  $d$  in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where  $P$  is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

### ABBREVIATION DEFINITION

The following abbreviations and acronyms may be found in this document. Their definition is explained below.

cm	Centimeters
CCW	Counterclockwise
CW	Clockwise
in.	Inches
GHz	Gigahertz
mm	Millimeters
MHz	Megahertz
SAE	Society of Automotive Engineers
SID	Source-to-image distance
W	Watts

# Chapter

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# 2

## *GENERAL INFORMATION*





# Chapter 2 General Information

## OVERVIEW



**NOTE:** The user should read this manual in its entirety prior to using this equipment. It should be kept in a location near the equipment and be readily accessible to those who operate it.

This document is intended to assist users in the safe and effective operation of the equipment described herein. Pay special attention to all the information described in the Safety section (refer to Chapter 1, SAFETY NOTICES).

This manual is written for trained users of the Floor-to-Ceiling Tubestand, Model QS-500 and Free-Standing Tubestand, Model QS-550 (hereinafter referred to as the Tubestand), and for authorized field service personnel. Quantum Medical Imaging, LLC assumes no liability for use of this document if any unauthorized changes to the content or format have been made.

### KEY FEATURES

It is imperative that all safety procedures described in this manual be strictly adhered to, in order to ensure the safety of both patient and user.

The key features of the Model QS-500 and QS-550 Tubestand are as follows:

- Vertical travel 1537 mm (60.5 in.), longitudinal travel 2438.4 mm (96.0 in.) using a 10-ft floor track
- Fail-safe Electromagnetic Lock for vertical Tubestand motion
- Electromagnetic Locks for longitudinal and angulation Tubestand motions
- 40 in. and 72 in. SID indicators (metric equivalents available) on Handgrips and Vertical Column (40 in.) and Floor Track (72 in.)
- Tube/Collimator positioning Handgrips provide Lock Release Buttons for quick Tube positioning
- As low as 330.2 mm (13 in.) focal spot-to-floor distance
- Model QS-500 Tubestands equipped with QS-50R option: permits  $\pm 90^\circ$  Vertical Column Rotation

## Chapter 2 General Information

- Models QS-500 and QS-550 Tubestands equipped with TechVision Handgrip option: TechVision replaces the standard equipment hand grips to provide Tubestand position controls and indicators and serves as a Generator Remote Control Panel. Refer to the TechVision Remote Control Panel Service and Operator's Manuals for complete installation and operation instructions.

This product is intended to be used and operated only in accordance with the safety procedures given within this manual for the purpose for which it was designed. The intended use is given below. Nothing stated in this manual reduces user's professional responsibilities for sound judgment and best practice.

### **INTENDED USE**

The Tubestand is intended for use as a support structure used to position a diagnostic x-ray tube housing assembly for a medical radiographic procedure.

Use of the equipment for purposes other than those intended and expressly stated by the manufacturer, as well as incorrect use or operation, may relieve the manufacturer or his agent from all or some of the responsibility for resultant non-compliance, damage or injury.

### **COMPATABILITY STATEMENT**

The Quantum Medical Imaging Tubestand is compatible with Quantum Medical Imaging manufactured tables and high-voltage x-ray generators, and with other manufacturer's equipment having equivalent means for indication of SID and perpendicularity.



**NOTE: Electrical Ratings can be found in the Tubestand Service Manual.**

### MAIN COMPONENTS - MODEL QS-500

See Figure 2-1. The Model QS-500 Tubestand contains:

- 1 X-Ray Tube
- 2 Handgrips
- 3 Collimator
- 4 Floor Track
- 5 Base Assembly (QS-50R option permits  $\pm 90^\circ$  Vertical Column Rotation)
- 6 Serialization Label
- 7 Vertical Column
- 8 Transverse Arm/Vertical Trolley
- 9 Wall/Ceiling Track

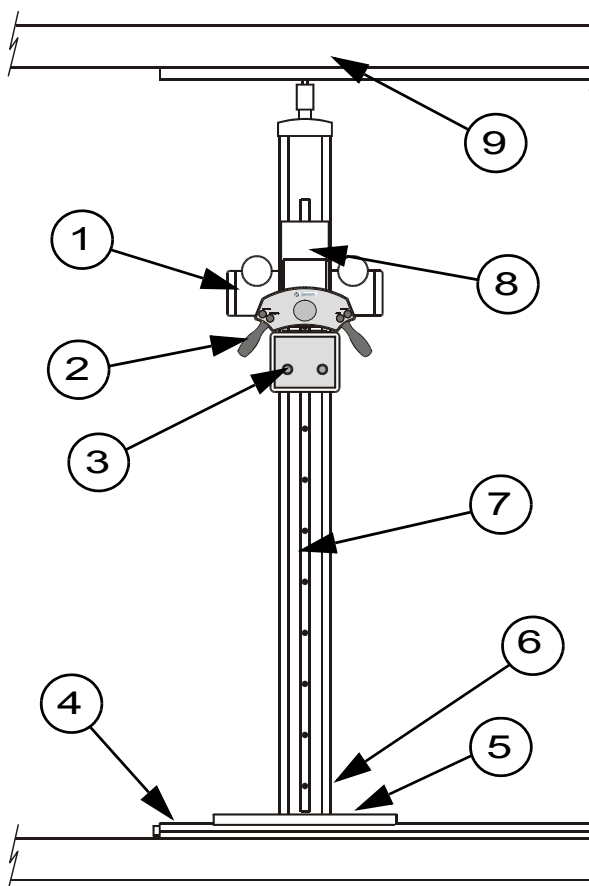
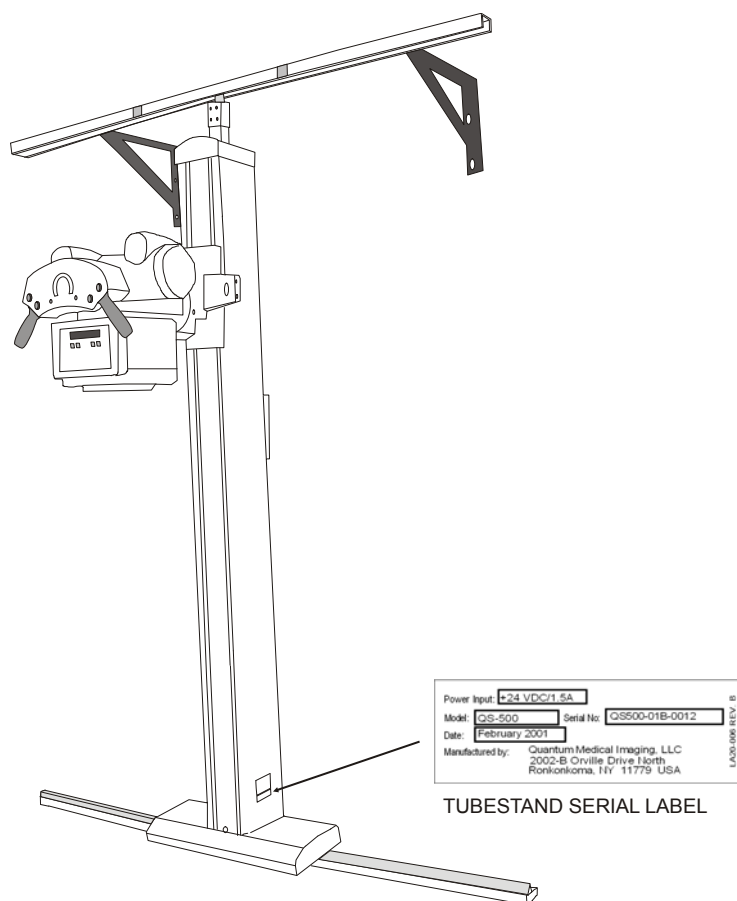


Figure 2-1. Floor-to-Ceiling/Wall Model QS-500 Series

## Chapter 2 General Information

### LABELING - MODEL QS-500

Figure 2-2, below, shows the locations of the serial and regulatory labels on the Model QS-500 Tubestand.



QS-500 outline drawing.wmf.cdr

**Figure 2-2. Floor-to-Ceiling/Wall Model QS-500 Series  
Label Locations**



### MAIN COMPONENTS - MODEL QS-550

See Figure 2-3. The Model QS-550 tubestand contains:

- 1 X-Ray Tube
- 2 Handgrips
- 3 Collimator
- 4 Floor Track
- 5 Base Assembly
- 6 Serialization Label
- 7 Vertical Column
- 8 Transverse Arm/Vertical Trolley

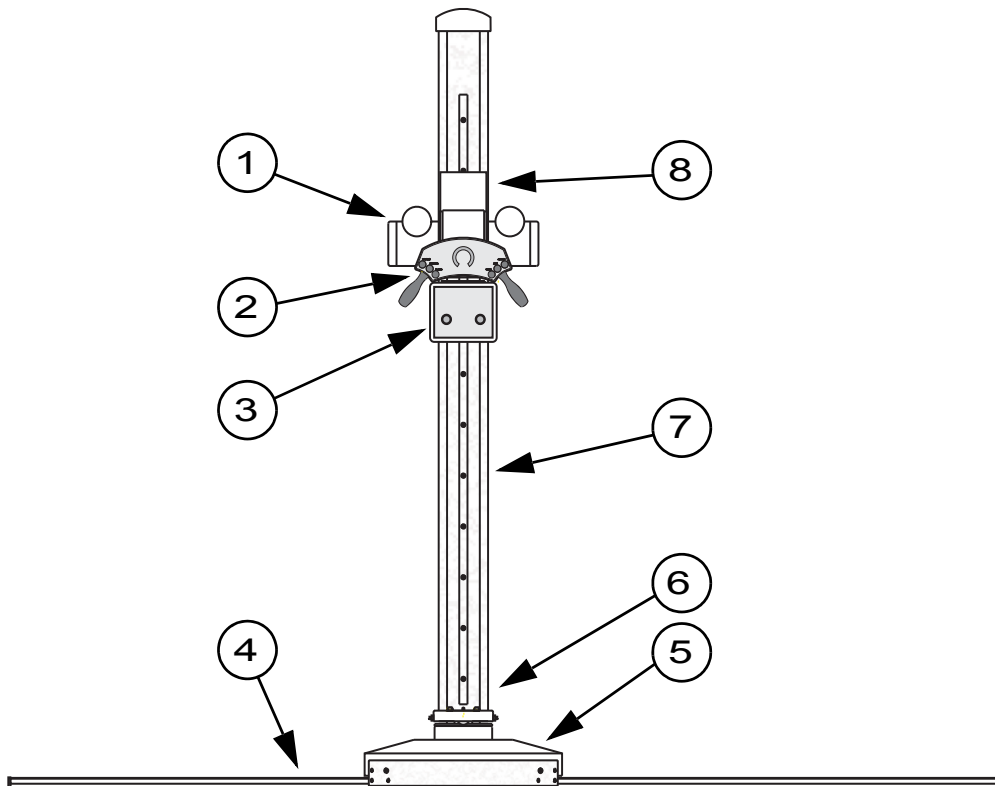
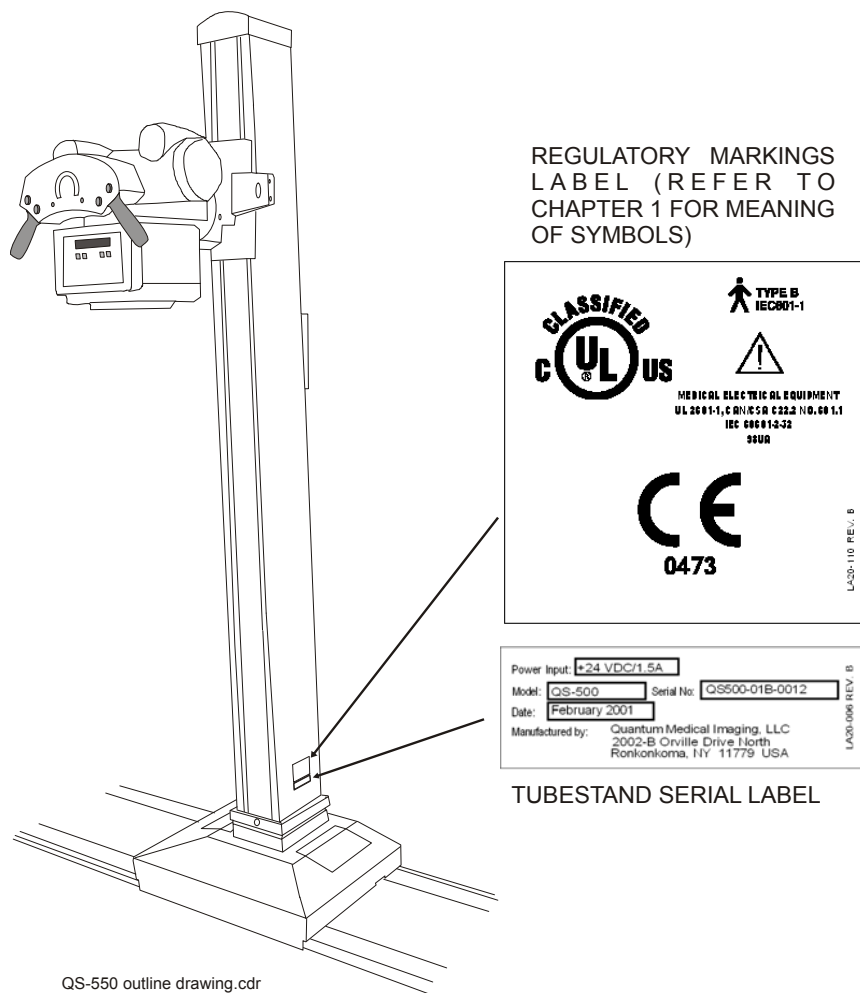


Figure 2-3. Free-Standing Deluxe Tubestand, Model QS-550

## Chapter 2 General Information

### LABELING - MODEL QS-550

Figure 2-4, below, shows the locations of the serial and regulatory labels on the Model QS-550 Tubestand.



**Figure 2-4. Free-Standing Tubestand Model QS-550  
Label Locations**

# Chapter

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# 3

## *OPERATION*





### OVERVIEW

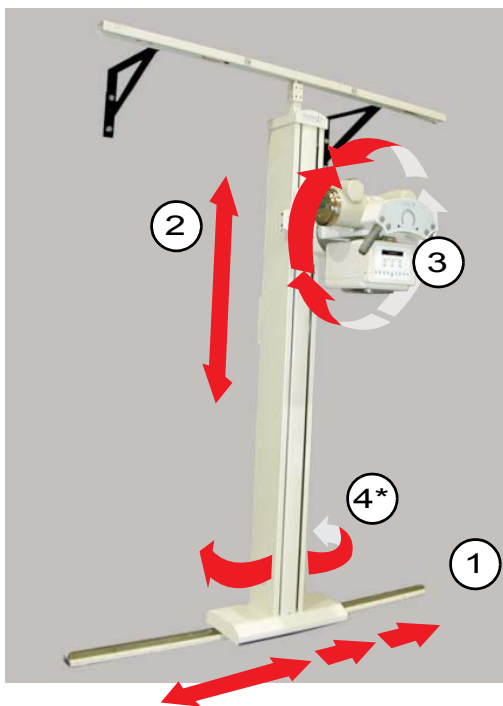
This chapter explains how to operate Tubestand Models QS-500 and QS-550. Refer to Table 3-1 for descriptions and functions of the controls and indicators.



**WARNING!** All movable assemblies and parts of this equipment must be operated with reasonable care. Manufacturer's equipment recommendations described in this manual must be observed.

### MANUAL MOTIONS AND DETENTS - MODEL QS-500

The Floor-to-Ceiling Tubestand, Model QS-500 provides three standard manual motions (four when equipped with QS-50R option), (see Figure 3-1).



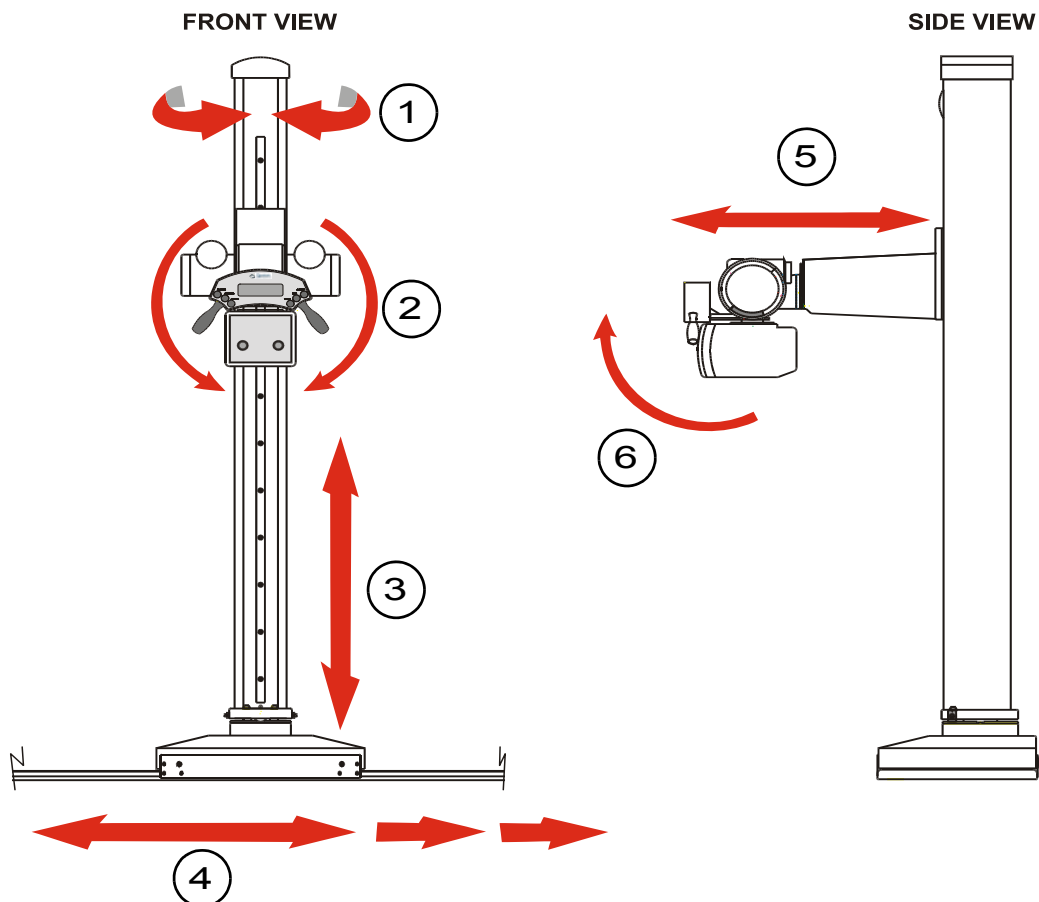
**Figure 3-1. Model QS-500 Tubestand Motions**

- 1 Longitudinal (left/right) travel of the Vertical Column is 102 cm (40 in.) and 183 cm (72 in.), and is marked by SID position detents and indicators.
- 2 Vertical travel of the Transverse Arm is 102 cm (40 in.) marked by SID position detent and indicator
- 3 Angulation of the X-Ray Tube/Collimator (mechanical detents at 0 °, 90 ° (CW), and 90 ° (CCW))
- 4\* Requires QS-50R Option: Rotation of the Vertical Column (detents at 0 °, 90 ° clockwise, and 90 ° counterclockwise)

## Chapter 3 Operation

### MANUAL MOTIONS AND DETENTS - MODEL QS-550

The Free-Standing Tubestand, Model QS-550 provides six manual motions, with mechanical detents for each motion to aid in equipment positioning (see Figure 3-2):



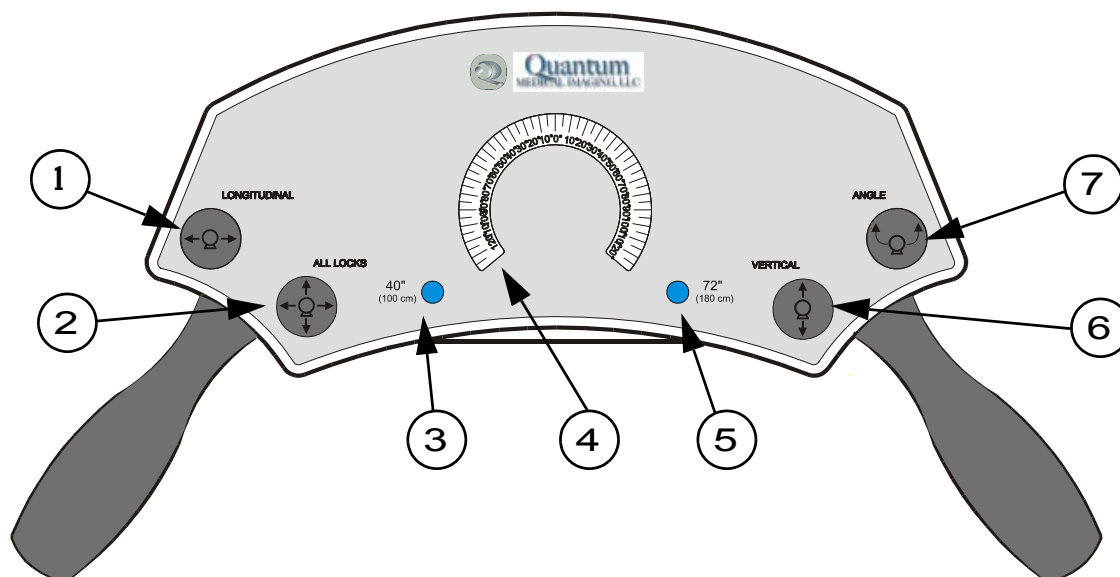
**Figure 3-2. Model QS-550 Tubestand Motions**

- 1 Rotation of the Vertical Column (detents at 0 °, 90 ° clockwise, and 90 ° counterclockwise)
- 2 Angulation of the X-Ray Tube/Collimator (detents at 0 °, 90 ° clockwise, and 90 ° counterclockwise)
- 3 Vertical travel of Transverse Arm is 102 cm (40 in.) with SID position detent
- 4 Longitudinal (left/right) travel of the vertical column 102 cm (40 in.) and 183 cm (72 in.) with SID position detents
- 5 Transverse (cross-table) travel of the Tube Arm (+5 in. to -5 in. relative to center position)
- 6 Rotation of the tube/collimator (+40 °, -20 °)

### HANDGRIP CONTROLS AND INDICATORS

The Tubestand is equipped with a Handgrip Control Module, which provides the operator with the ability to easily move the Tubestand throughout its longitudinal, vertical, and transverse operating envelope. The Handgrip also controls X-ray Tube angulation positioning ( $90^\circ$  CW and  $90^\circ$  CCW), and Vertical Column rotation ( $\pm 90^\circ$ ) on models equipped with the QS-50R option, as shown in Figure 3-5.

As shown in Figures 3-3 through 3-6, the Handgrip display features clearly marked push-buttons (using standard symbology) and indicators, which are described in Table 3-1. Figures 3-7 and 3-8 show the locations of the other SID indicators.



**Figure 3-3. Model QS-500 Handgrips Controls and Indicators (Standard Configuration)**

## Chapter 3 Operation

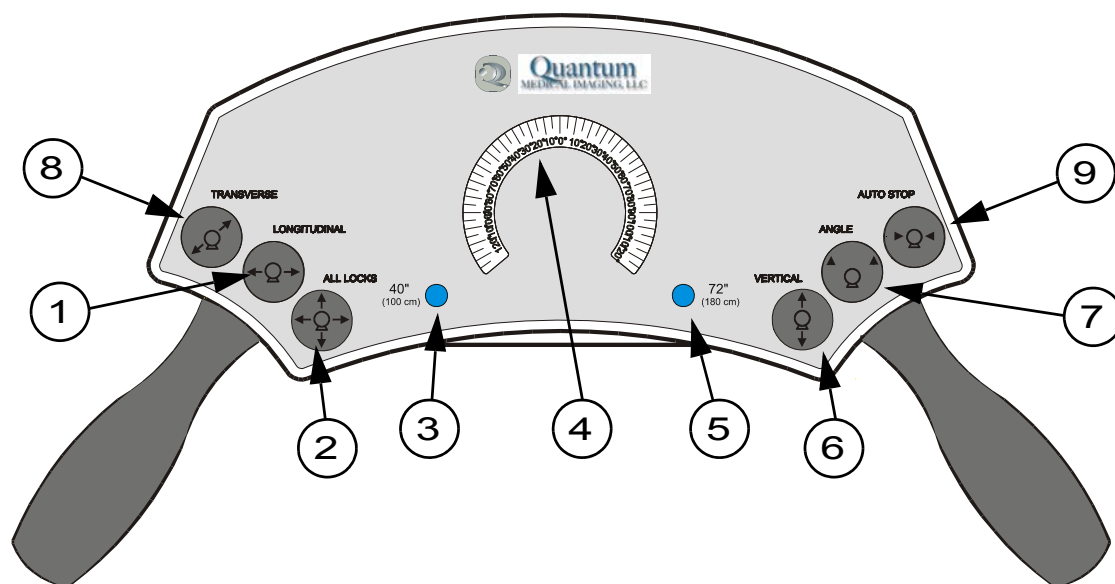


Figure 3-4. Model QS-500 Handgrips Controls and Indicators  
(With QS-55V Transverse Option)

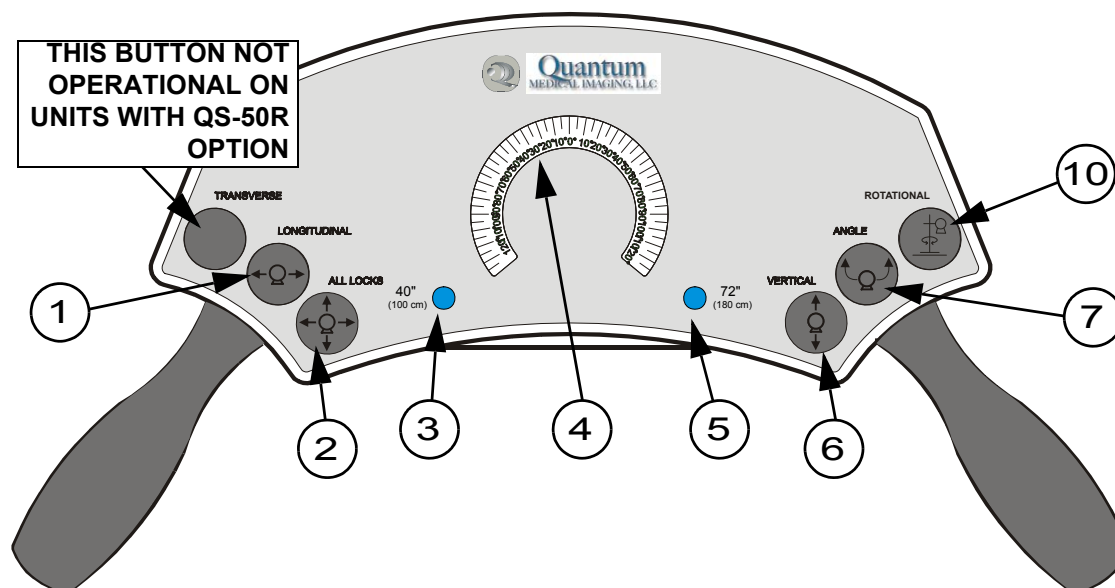


Figure 3-5. Model QS-500 Handgrips Controls and Indicators  
(Only used with QS-50R option)



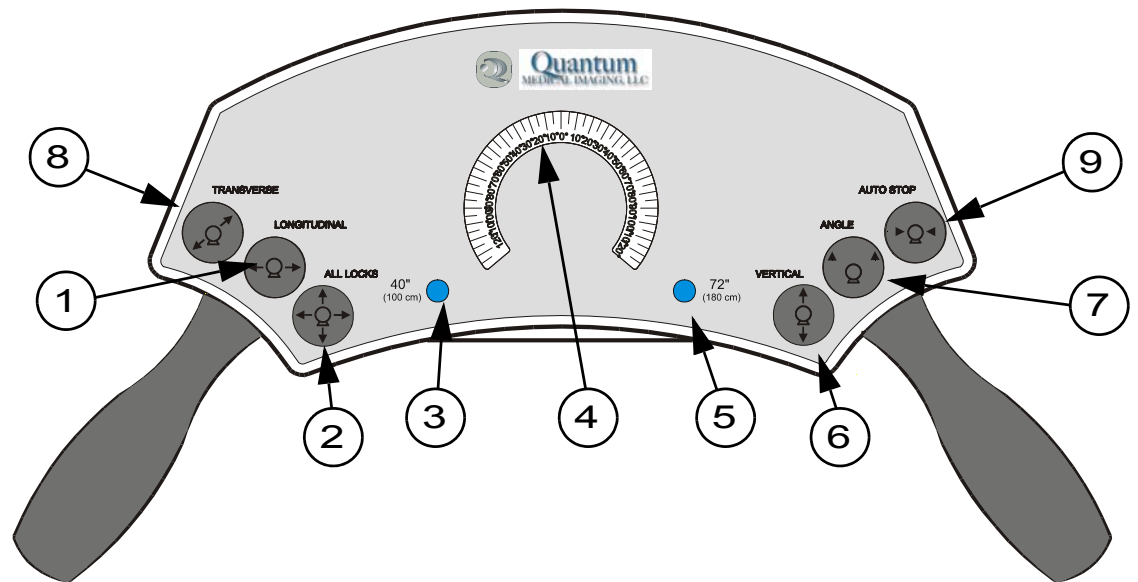


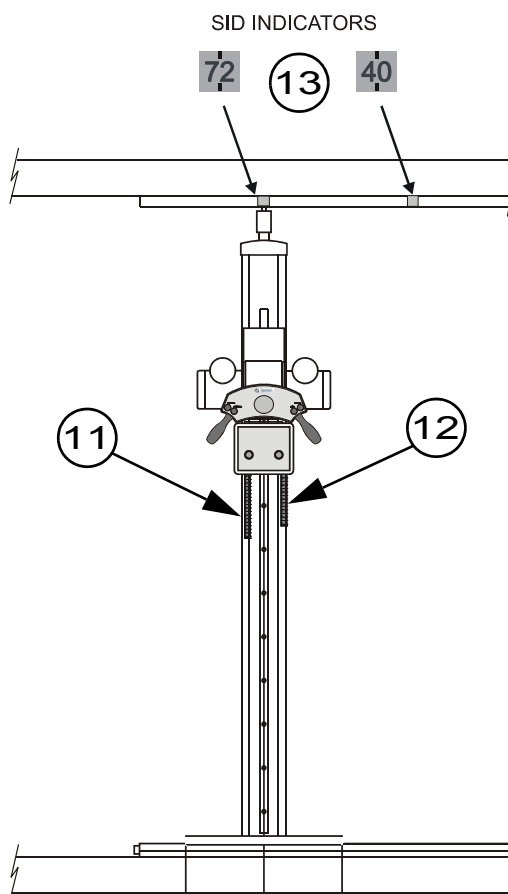
Figure 3-6. Controls and Indicators (Model QS-550 Handgrips)

## Chapter 3 Operation

**Table 3-1. Tubestand Controls and Indicators**

Item	Model(s) Used On	Type	Function
1	QS-500, QS-550	Push button Control	<u>Longitudinal Lock Release</u> - Releases magnetic lock to allow tube stand longitudinal motion along floor track.
2	QS-500, QS-550	Push button Control	<u>All Locks Release</u> - Releases all tube stand magnetic locks to allow vertical, transverse, longitudinal, and tube angulation motions.
3	QS-500, QS-550	Indicator (Blue)	<u>SID at 40 in. (100 cm)</u> - Indicates tube and wall or table receptor is at 40 inches (100 cm) source-to-image distance (SID).
4	QS-500, QS-550	Indicator	<u>Tube Angulation Display</u> - Indicates angle of tube rotation.
5	QS-500, QS-550	Indicator (Blue)	<u>SID at 72 in. (180 cm)</u> - Indicates tube and wall receptor is at 72 inches (180 cm) SID
6	QS-500, QS-550	Push button Control	<u>Vertical Lock Release</u> - Releases magnetic lock to allow vertical tube motion.
7	QS-500, QS-550	Push button Control	<u>Angulation Lock Release</u> - Releases magnetic lock to allow tube angulation.
8	QS-500 (w/QS-55V option), QS-550	Push button Control	<u>Transverse Lock Release</u> - Releases magnetic lock to allow transverse tube motion.
9	QS-550	Push button Control	<u>Auto-Stop</u> - When this button is pressed in combination with the Longitudinal Lock Release button, longitudinal movement of the vertical column stops automatically when it reaches either the 40 in. or 72 in. SID detent on the floor track.
10	QS-500 (w/QS-50R option)	Push button Control	<u>Rotational Lock Release</u> - Releases magnetic lock to allow $\pm 90^\circ$ Rotation of the Vertical Column.
11	QS-500, QS-550	Indicator Label	<u>Source-to-Table Receptor SID Scale</u> - Indicates distance from tube focal spot-to-film plane image receptor (in either metric or SAE units)

Item	Model(s) Used On	Type	Function
12	QS-500, QS-550	Indicator - Label	<u>Source-to-Table Top SID Scale</u> - Indicates distance from tube focal spot-to-table top (in either metric or SAE units)
13	QS-500, QS-550	Indicator - Label	<u>SID at 100 cm or 40 in. and 180 cm or 72 in. markers</u> - Indicates SID is at 100 cm or 40 in. (wall stand or table receptor) or at 180 cm or 72 in. (wall stand receptor only).
14	QS-550	Indicator - Label	<u>Trunnion Rotation Scale</u> - Indicates rotation angle of tube when system is equipped with optional trunnion-mounted x-ray tube.



**Figure 3-7. Model QS-500 Tubestand Controls and Indicators  
Ceiling Track/Floor Track**

## Chapter 3 Operation

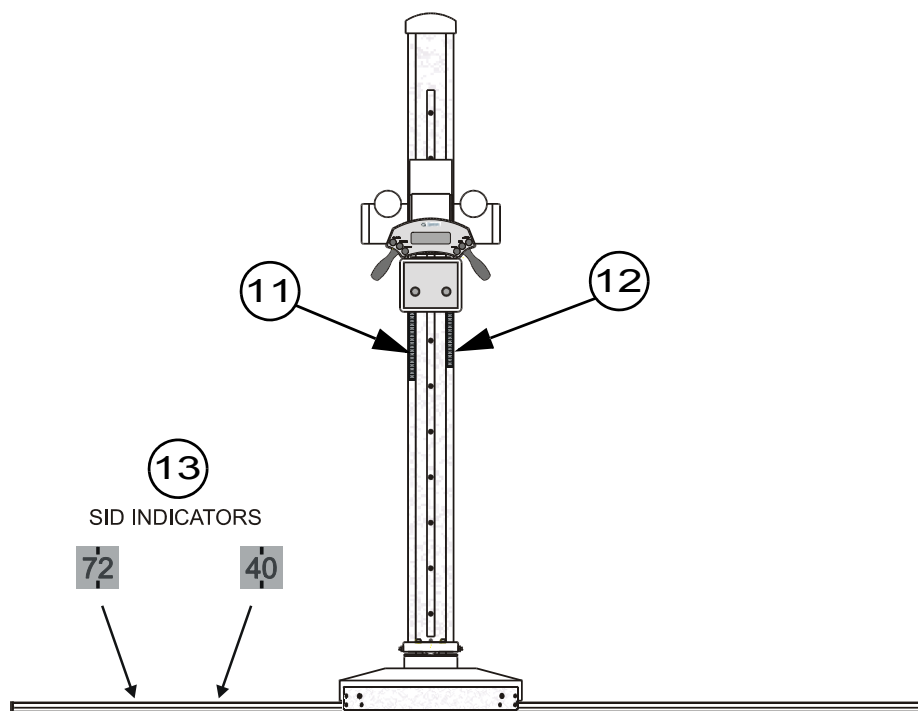


Figure 3-8. Model QS-550 Tubestand Controls and Indicators  
(Vertical Column/Floor Track)

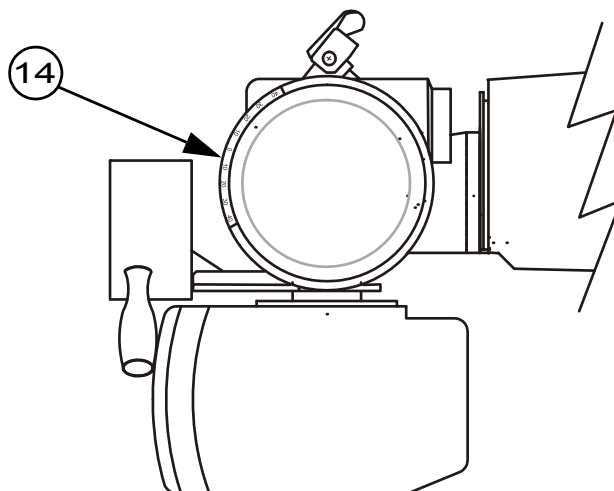


Figure 3-9. Model QS-550 Tubestand Controls and Indicators (Trunnion Assembly)

# Chapter

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# 4

## *USER MAINTENANCE*





### OVERVIEW

This chapter is designed to assist the system user in maintaining the smooth operation of the Tubestand. This product has been factory tested to assure its required performance in an X-ray System. The user is responsible for performing routine maintenance and inspection procedures to ensure proper equipment operation. Aside from routine maintenance, any abnormal noise, vibration, or unusual performance should be investigated by a qualified service representative. Preventive maintenance or any repair service should be performed only by qualified service personnel.



**WARNING!** Failure to follow manufacturer's or service personnel's recommendations may result in serious injury.



**WARNING!** Only qualified and authorized persons shall work on this equipment. In this context, qualified means those legally permitted to work on the equipment, and authorized means those specifically authorized by local management.



**WARNING!** Changes, additions or maintenance to the equipment carried out by persons without appropriate qualifications and training and/or using un approved spare parts may lead to serious risk of injury and damage to the equipment as well as making the warranty void.

### USER MAINTENANCE

User maintenance consists of the following activities, which should be performed on a daily basis:

- Visually inspect the Tubestand for wear and cleanliness
- Clean the exterior painted surfaces of the Tubestand

#### Cleaning

The system user is responsible for the basic cleanliness of the equipment. Painted metal surfaces should be cleaned using a clean cloth slightly moistened in warm soapy water (use mild soap). Wipe with a clean wet cloth, then dry. Never use abrasive polish on this equipment. Use only alcohol-based liquid disinfectants.



**WARNING!** Always disconnect the equipment from the main power supply prior to any cleaning.

## Chapter 4 User Maintenance

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# Chapter

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# 5

## *WARRANTY INFORMATION*





## Chapter 5 Warranty Information

### WARRANTY STATEMENT

Quantum Medical Imaging (herein known as "QMI") warrants to buyer that any new product manufactured by QMI will be free from defects in material and manufacturing and conform substantially to applicable specifications in effect on the date of shipment when subjected to normal, proper and intended usage by properly trained personnel. QMI will act as the sole judge in determining whether equipment or part is defective by reason of manufacture.

All QMI products shall be warranted for a period of 12 months from the original installation, the date of which will be determined by a completed, returned warranty card, which must be returned to QMI headquarters within 30 days of system installation. In no case shall the warranty exceed 15 months from the date of shipment. If the warranty card is not returned to QMI, then the warranty period will begin immediately on the date of shipment (invoice date) and last for twelve months. Buyers should complete only one (1) form per system or component.

### WARRANTY CARD

*Cut along dashed line*



Name of Owner _____		
Name of Facility _____		
Address 1 _____		
Address 2 _____		
City _____	State _____	
Country _____	Zip _____	
Phone _____		
e-mail _____		
Name of Distributor _____		
Installation Date _____		
Check Type of Equipment and Provide ID No.'s:		
	<u>Model No.:</u>	<u>Serial No.:</u>
<input type="checkbox"/> Hi-Freq. Generator	_____	_____
<input type="checkbox"/> Table	_____	_____
<input type="checkbox"/> Collimator	_____	_____
<input type="checkbox"/> Hi-Tension Cable	_____	_____
<input type="checkbox"/> Tube	_____	_____
<input type="checkbox"/> Tube Stand	_____	_____
<input type="checkbox"/> Wall Stand	_____	_____
<input type="checkbox"/> Other	_____	_____

## Chapter 5 Warranty Information

Fill in and mail Warranty Card promptly to:

Quantum Medical Imaging  
2002-B Orville Drive North  
Ronkonkoma, N.Y. 11779 USA

Any component furnished without charge to Buyer/Dealer during the warranty period to correct a warranty failure shall be warranted only to the extent of the unexpired term of the warranty of the original product. This warranty extends only to the original purchase and is not transferable unless authorized in writing by Quantum Medical Imaging.

Products manufactured by parties other than QMI, where QMI acts solely as distributor or reseller, will carry their respective manufacturers' warranties, including each of their independent terms and conditions.

Warranty consideration will be given only for defective QMI products properly returned to the factory in accordance with QMI's Returned Materials Procedure (refer to Dealer Price Book or contact QMI customer service).

### WARRANTY EXCLUSIONS

The foregoing warranties are exclusive and in lieu of all other warranties, whether written, oral, express, implied or statutory. NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE SHALL APPLY. Quantum Medical Imaging (QMI) Warranty is exclusive of:

- 1) Failure of Buyer/Dealer to prepare the site or provide power requirements or operating environmental conditions in compliance with any applicable instructions or recommendations of QMI.
- 2) Failure of Buyer/Dealer to provide the proper incoming power required to support the equipment in accordance with the recommendation of QMI.
- 3) Any modification of product performed by a party other than QMI.
- 4) Combining products deemed by QMI to be incompatible.
- 5) Improper or extraordinary use of the Product, improper maintenance of the Product, or failure to comply with any applicable instructions or recommendations of Quantum Medical Imaging.
- 6) Misuse, tampering or, negligent storage/handling of the Product by Buyer, its employees, agents or contractors.
- 7) Fuses, glassware, high voltage cables and other items deemed by QMI to be expendable.
- 8) Acts of God, acts of civil or military authority, fires, floods, power failure or electrical power surges, strikes or other labor disturbances, war riots or other causes beyond the reasonable control of Quantum Medical Imaging.
- 9) Installation, troubleshooting or repair service are not included in this warranty. Technical service and maintenance is the responsibility of the dealer selling the equipment.
- 10) The Manufacturer is relieved of any responsibility for damage during shipment after the freight carrier picks up and begins transport of the unit for delivery.

### BUYER'S REMEDIES

If Quantum Medical Imaging determines that any Product fails to meet any warranty during the applicable warranty periods, Quantum Medical Imaging shall correct any such failure as follows:

- A) By repairing, adjusting, or replacing any defective or non-conforming Parts or Products.
- B) By making available any necessary repaired or replacement parts or assemblies.

Quantum Medical Imaging shall have the option to furnish either new or exchange replacement parts or assemblies. All returned parts shall become the property of Quantum Medical Imaging if said parts have been determined by QMI to be defective by reason of manufacture.

The preceding Paragraphs set forth Buyer's Remedies and Quantum Medical Imaging's sole liability for claims based upon failure of the product to meet any warranty, whether the claim is on contract, warranty, Tort (including negligence and strict liability) or otherwise, and however instituted. And upon the expiration of the applicable warranty period, all such liability shall terminate. In no event shall Quantum Medical Imaging be liable for special or consequential damages arising out of the use or ability to use its equipment whatsoever.

The warranties and remedies available to the buyer are conditioned upon all claims under this warranty being made in accordance with the aforementioned warranty statement.

### WARRANTY RETURN PROCEDURE

A fully completed Field Returned Material Evaluation Form must be returned with any defective product or any returned item. All returns must have the Serial Number of the Equipment and/or the Specific Part, written on the Field Returned Material Evaluation Form. All freight charges resulting from Warranty Returns are the responsibility of the Buyer or Dealer.

### EQUIPMENT IN TRANSIT

QMI cannot assume responsibility for any equipment damaged in transit. To protect the buyer/dealer, the receiver of any equipment should examine all cartons and crates carefully at time of delivery. If damage is apparent, make a notation on the delivery receipt, request an inspection by the freight carrier, and if applicable, file appropriate carrier claim. Should concealed damage be detected, immediately notify the freight carrier and request an inspection. The purchaser (dealer/customer) is fully responsible for the filing of freight damage claims to the freight carrier.

Quantum Medical Imaging is not responsible for any loss or damage to products once they have been shipped from our factory. The dealer or customer is responsible for full payment to Quantum Medical Imaging for all invoices, as per our standard payment terms, regardless of freight damage or processing of an insurance claim, by the dealer or customer.

## Chapter 5 Warranty Information

### **VOIDING WARRANTY**

Any installation, maintenance, repair, service, relocation or alteration to or of, or any other tampering with the product, performed by any person or entity other than Quantum Medical Imaging or a certified Quantum Medical Imaging dealer without the written approval of an authorized person at Quantum Medical Imaging, shall immediately void and cancel all warranties with respect to the affected product.